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### Yacht Race Monitoring

Above, yachtsman Philip Saltonstall Weld is using a movie camera to record the last moments of his record solo transatlantic crossing in the three-hulled, 51-foot sailing boat *Moxie*. A retired newspaper publisher from Gloucester, Massachusetts, Weld was the winner of last summer's Observer Single-handed Transatlantic Race (OSTAR), an event sponsored by the London *Observer* and the Royal Western Yacht Club of Plymouth, England. He made the 3,000-mile crossing from Plymouth to Newport, Rhode Island in 17 days, 23 hours, 12 minutes—almost three days better than the previous record—and became the first American ever to win the grand prize of solo sailing.

Weld and 87 other OSTAR participants were aided by a French-American space-based monitoring system which reported the yachts' positions throughout the race

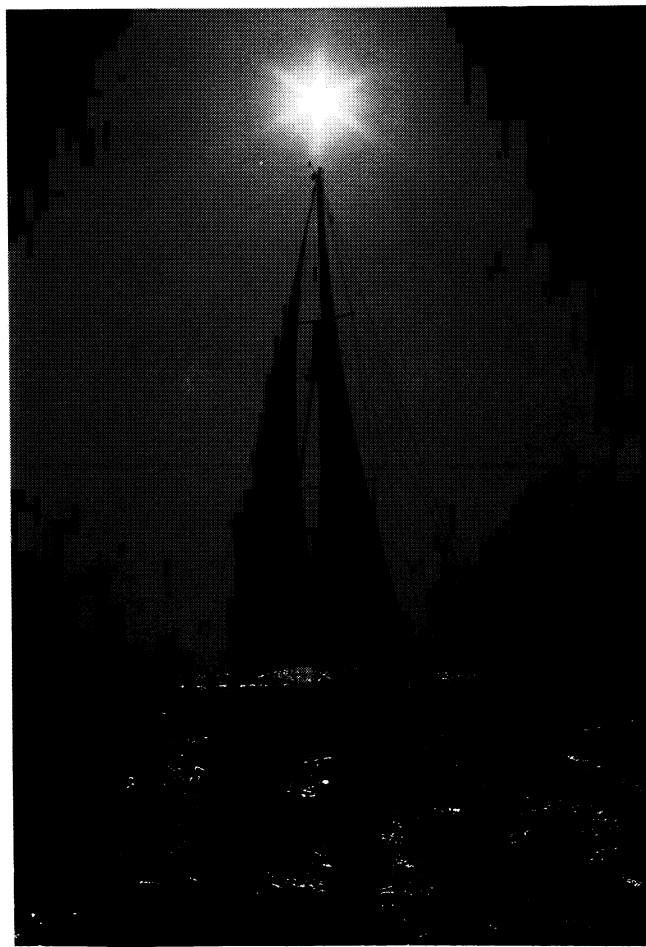


Photo by C. K. Chiodi, Multihulls Magazine

and doubled as an emergency locator service. Called ARGOS, the system is a cooperative project of NASA, the National Oceanic and Atmospheric Administration (NOAA) and the French space research organization Centre National d'Etudes Spatiales (CNES). A key element of the system is the NASA-developed Tiros-N environmental satellite (below) operated by NOAA. The ARGOS system is normally used to collect worldwide oceanographic and meteorological data from portable transmitters on ships, buoys and icebergs. The transmitters report atmospheric pressure, air temperature and water temperature to the satellite, which relays the information to ground processing stations. NASA pioneered this type of data collection system with its Nimbus-6 satellite and a low-power portable transmitter developed by Goddard Space Flight Center. In the ARGOS system, the transmitters and the satellite on-board receiver/computer are French-built.

ARGOS served a dual purpose in the OSTAR race. Since each boat carried a portable transmitter, 88 new sources of oceanographic data became available for the duration of the race. In addition to sending air/water data, each transmitter sent a coded signal identifying the yacht, thus enabling frequent updating of the boats' positions. A sailor in distress could trip a transmitter

switch to indicate an emergency, alerting ARGOS personnel who would advise race officials; the latter would then coordinate search/rescue operations with the proper authorities.

Use of ARGOS made the OSTAR competition the most accurately reported sea race ever conducted. Circling Earth in polar orbit, Tiros-N picked up the yachts' signals each time it passed over the North Atlantic. Satellite equipment decoded the signals, recorded the time a signal was received from each boat, and relayed the information to NOAA's facility at Suitland, Maryland. From Suitland, the raw data was passed to the CNES center in Toulouse, France, where it was computer-processed and converted to race progress bulletins detailing the position of each yacht. The bulletins were transmitted to the Royal Western Yacht Club in Plymouth, to the press center in London, and to the finish station at Newport. For each position updating, the entire process took about two hours.

NASA played an emergency role in OSTAR position plotting when NOAA's Suitland computer failed. A data collection and processing station at Goddard Space Flight Center (below right) took over the job of computing and relaying position data to Toulouse for the final three days of the race.

